Land as a Global Resource

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American land is a global resource. It supplies much of the world with food, fiber, and forest products. It is a vital asset to the Earth environment. It is the base upon which new production and conservation technologies have been devised and improved upon for application around the globe.

Alleviation of World Hunger

Total volume of food produced in each of the last 5 years has exceeded the net gain in world population. Per capita food availability is improving. Even so, millions will suffer from malnutrition due to unequal distribution and poverty.

Despite the world food surplus, many people in the world still lack food security. This year a worldwide net gain in population of 83 million is expected—most of these in the developing countries.

In the short term, world hunger can only be alleviated by emergency food aid. During 1984-1986, overall U.S. aid to Africa for drought relief was $2.2 billion. It amounted to 6 million metric tons of food from the United States or about 30 pounds of food from each of our 240 million American citizens. Total food aid shipments to the world's hungry in 1985 and 1986 from all donor countries was 9.5 million tons. Fortunately, the United States and other high income countries always respond to famine whenever it occurs.

Longer term or chronic problems in poor countries have been approached by the United States through economic assistance programs of the U.S. Agency for International Development and through cooperation with the World Bank and United Nations. These programs try to increase local food production to reduce malnutrition, with emphasis on education, research, and technical assistance. By helping these countries increase their per capita income, they tend to purchase more products from the United States. Forty percent of our agricultural exports now go to developing countries. Total U.S. agricultural exports reached a high of $40 billion in 1980. At that time, nearly 1 out of every 2.5 of our acres was producing food for export. Agricultural exports dropped from a high in 1980 to a level of $26.3 billion in 1986. American land still produced food for many millions of people. Nevertheless,

U.S. soybeans arrive in Manilla and are loaded off ships onto barges. (Dana Downie, 0785X666-35A)

the substantial loss of foreign markets since 1980 has caused turmoil for American agriculture.

How much land is required to sustain an individual to a satisfactory standard of living? In 1946, the Soil Conservation Service estimated that the average American needed about 1.2 hectares (2 ½ acres) of cultivated land to supply annual food needs. American farmers were told that, while the United States had a land surplus, there was not enough good land in the world to provide a satisfactory level of living for the total population. Therefore, it was imperative to carefully conserve every acre in the United States as an obligation to a predominantly hungry world and as a safeguard for future generations. That was 1946—following reports of 3 million deaths in India and another 3-4 million deaths in China from starvation.

This approach to promoting soil conservation helped. But was the reasoning sound? What has happened to that so-called "2 ½-acre requirement" in the past 40 years? The major impact of new technologies in the agricultural sector came after World War II. Hybridization, a revolution in agricultural chemicals (particularly pesticides and fertilizers), irrigation, a major move toward mechanization, significant improvements in food processing and distribution, and many other new technologies swept through the food sector. No longer are 2 ½ acres of arable land per person required. This basic requirement has been reduced substantially and continues to vary with the level of productivity, the kinds of crops produced, the quality of the land, and our concepts of an adequate standard of living. However, none of the new technologies on the horizon will separate people from dependence on the land for food production. American land will continue to supply a part of the food needs of many people in foreign countries.

Forest Products

Worldwide ties to American land also can be demonstrated outside the food sector. The United States is the world's second largest exporter of forest products, with about 15 percent of the world market share. At the present time, the United States ships about 20-30 million metric cubic meters of forest products to other countries. The primary markets for U.S. wood products are Japan, China, Canada, South Korea, and West Germany.

As the world's population increases, and as many developing countries continue to exploit their valuable forest resources, concern about the limited world supplies of forest products will increase. Also, a better understanding of forest ecosystems and the importance of maintaining biological diversity, will lead to more careful use—and perhaps reduced harvest of forest products—in environmentally sensitive areas. The United States has instituted reforestation programs, sustained yield concepts, and multiple-use programs that should secure the position of

Many modern U.S. soil and water conservation practices are found throughout the world. This low irrigation sprinkler provides broad area coverage and can be moved easily. (Tim McCabe, SCS, CA-7515-24A)

American forest land as a true global resource.

Fiber

American land is an important source of production for the world's natural fibers—particularly cotton, wool, and mohair. These natural fiber industries have undergone three major changes in recent years: (1) The source of production shifted as developing countries search for a cash crop to supply much needed foreign currency; (2) The international trade of natural fibers shifted toward Asian nations as they develop textile industries based on low labor costs; and (3) Synthetics continue to encroach on the natural fiber market.

The United States remains the major exporter of cotton with about 30 percent of the trade. Other leading exporters are the U.S.S.R., China, India, Pakistan, and Sudan. Japan, South Korea, Taiwan, and others are increasing their cotton imports. Western Europe accounts for about 25 percent of the import market.

Sheep numbers continue to decline in the United States as they have for decades although the trend is slowing. More than 10 million sheep and about 2.5 million goats in the United States supply 5 percent of the world's consumption. The U.S.S.R., Australia, and New Zealand remain the leading producers of wool.

Science and Technology

The vast, variable, and productive American land challenges scientists as well as farmers, ranchers, and agribusiness people to produce in abundance. So, American land justifiably can be considered a global resource for new developments in science and technology.

The chemical revolution, hybridization, genetic engineering, and other

Much needed food grown by U.S. farmers arrives in Honduras, one of many countries with insufficient food to feed its people. (Susan Scarfman, AID)

achievements were essential to building the United States food dynamo. But the American land itself also contributed the proper environment—a land base. Government policies encouraged production and a land-grant university/U.S. Department of Agriculture cooperative system tied together the three important elements of success: Education aimed at the "common man," research focused on current problems, and Extension to carry the information to the farmers.

The Title XII amendment to the U.S. Foreign Assistance Act of 1975 was designed by Congress to encourage the developing countries to use the U.S. land-grant model to increase their own food production. The "institution building" approach to third-world country development is now a major objective of the U.S. Agency for International Development.

The land-grant system led to creation of new agricultural professions—animal husbandry (from veterinary science), agricultural economics (from business and economics), range ecology (from plant and animal science), and vocational agriculture. These fields are now well established and represented by worldwide professional societies. Concepts of

agricultural extension and technology transfer now are used in the institutions of developing countries. Youth programs of 4-H and Future Farmers of America can now be found in third world countries.

Conservation Ethic

During the frontier settlement in America, and for many years thereafter, the emphasis of research, extension, and government programs was on increasing production to meet the needs of a hungry world. At some point in our history, however, Americans began to realize that our land resources were not unlimited and that our policies were leading to indiscriminate sodbusting of marginal lands, overgrazing by livestock, and general neglect of the valuable resource base.

A shift in American policies from exploitation to conservation was powered by the Dust Bowl disaster of the 1930's. Great "evangelists" for conservation emerged such as Hugh H. Bennett, W.C. Lowdermilk and Gifford Pinchot. These leaders helped establish the Soil Conservation Service, the present organization of the Forest Service, and approaches to both public and private land management that incorporated the conservation ethic.

Environmental Movement

Early concerns about conservation aimed at sustaining the productivity of the environment. Concerns about its capacity to absorb pollutants did not come until the environmental movement of the 1960's and 1970's. Since then, water and air pollution, major changes in biological populations, and perturbations in ecosystems have been and continue to be explored. Protection of endangered species, reduction of chemical pollution, and close study of possible climatic change are now areas of concern and research.

Wilderness Areas

The concept of wilderness areas probably originated in the United States. Dr. Aldo Leopold, an employee of the U.S. Forest Service, was instrumental in designating the first wilderness as a part of the Gila National Forest in New Mexico over 50 years ago.

The next phase of the conservation and environmental movement will be focused on the need to better understand natural and human-influenced ecosystems—systems that operate in the biosphere and geosphere. Far too little is known about the hydrologic cycle, energy flow, air pollution, and the potential for human-caused climatic change. The development programs and resource management policies within one country often impact on other countries.

America, because of its valuable land base, can and will continue to contribute to both production technology, to soil and water conservation practices, and to a better understanding of the complex environment of which human beings are a part.